

## CLAIMS

1. A method for manufacturing a plastic optical fiber, the method comprising the steps of:

(a) applying winding tension to the heated plastic optical fiber; and

(b) winding the plastic optical fiber such that the plastic optical fiber just after the winding process has the shrinkage of 0.10% or smaller.

2. The method according to claim 1, wherein the diameter of the plastic optical fiber is 1000 $\mu$ m or smaller.

3. The method according to claim 1, wherein the drawing tension is 0.5 MPa to 5.0 MPa.

4. The method according to claim 1, further comprising the step of:

(c) adjusting the winding tension by an adjustment tension that is different from the winding tension.

5. The method according to claim 4, wherein the adjustment tension is 1.5 MPa to 7.0 MPa.

6. The method according to claim 1, wherein the heated plastic optical fiber is produced by melt-drawing a plastic optical fiber base material.

7. The method according to claim 1, wherein the plastic optical fiber is wound around a winding member that comprises a bobbin body and a soft material wound around the bobbin body;

wherein the hardness of the soft material measured by type E Durometer is 10 to 70.

8. The method according to claim 1, wherein the clad part  
5 of the plastic optical fiber is formed from fluorine resin.

9. The method according to claim 1, wherein the core part of the plastic optical fiber is formed acrylic resin.

10 10. The method according to claim 1, wherein the core part of the plastic optical fiber has a refractive index profile in which the refractive index decreases from the center to the surface.

15 11. A plastic optical fiber that is heated and wound around a winding member, the plastic optical fiber just after the winding process having the shrinkage of 0.10% or smaller.

12. A method for manufacturing a plastic optical fiber, the  
20 method comprising the steps of:

(a) melting and drawing a plastic optical fiber base material to form a plastic optical fiber;

(b) applying winding tension to the plastic optical fiber;  
and

25 (c) winding the plastic optical fiber such that the plastic optical fiber just after the winding process has the shrinkage of 0.10% or smaller.